

Shipping of an ECD from a gas chromatograph (GC) from Boulder, CO

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How often: Seldom, as needed.
Only as directed by GC point of contact in Boulder.

Special requirements: Appropriate hazardous material (haz-mat) training (DOT & IATA).

Supplies needed: Box and labeling in accordance with Title 49 CFR 173.424 requirements.

Introduction: Safety is a top priority at NOAA. The NOAA Safety and Environmental Compliance Office (SECO) is the lead organization for safety at NOAA. We want all employees and contractors to "promote a safe and healthy, environmentally responsible, energy efficient work environment". NOAA is involved in world-class measurements and research on ozone depleting, climate or greenhouse, and air quality trace. The electron capture detector (ECD) is one of the most sensitive detectors used to measure atmospheric trace gases containing oxygen, sulfur, fluorine, chlorine, bromine, or iodine atoms. When the ECD is coupled to a gas chromatograph (GC) to separate trace gases from air, this detection method (GC-ECD) is unique for detecting low atmospheric levels of trace gases in the parts-per-billion (ppb, 1 part in 10^9) and parts-per-trillion (ppt, 1 part in 10^{12}) ranges. Occasionally, an ECD will need to be shipped from a field site to Boulder for repair. This SOP addresses these rare instances.

Procedure:

1. NOAA trained staff oversee repairs by the manufacturer, if needed, and perform calibration of the ECD prior to shipment. Boulder instrument technician communicates with field site personnel that an ECD is ready to be shipped to the site.
2. The ECD and its housing (or can) will be shipped from Boulder as one complete sealed unit. *The can will NOT be opened at a remote site.*
3. ECD shipments will be sent from Boulder, Colorado to any of the NOAA Baseline Observatories (Barrow, Trinidad Head, Mauna Loa, American Samoa, South Pole, or Summit) via the current NOAA approved commercial shipping company (FedEx, UPS, etc.).
4. Confirm haz-mat certified shipping contacts for both the shipping party and the receiving party:
 - a. In Boulder, the site haz-mat specialist is Mr. Robert Zook, 303-497-3662, Robert.Zook@noaa.gov.
 - b. At Barrow, AK, Bryan Thomas, 907-852-6500 or Bryan.Thomas@noaa.gov, is trained as a haz-mat certified shipper.
 - c. At Trinidad Head, CA, Michael Ives, 707-407-5099 or Michael.Ives@noaa.gov, is trained as a haz-mat certified shipper.
 - d. At Mauna Loa, HI, Aidan Colton, 808-933-6965, ext 233 or aidan.colton@noaa.gov, is trained as a haz-mat certified shipper.

- e. At American Samoa, Diane Perry (684-258-2848 or Diane.M.Perry@noaa.gov) and Ben Kaiser (684-258-2848 or Benjamin.C.Kaiser@noaa.gov) are trained as a haz-mat certified shippers.
 - f. At South Pole and Summit Stations the National Science Foundation (NSF) contractor cargo staff are trained as a haz-mat certified shippers as a part of the initial hire training for the position. Staff change each year and the correct POC can be identified when needed.
- 5. The haz-mat certified shipper in Boulder will receive the open box from GMD staff (***GMD staff must deliver the package to building 22***). The shipper will certify the haz-mat packaging is correct and label the box in accordance with NOAA's current NRC authority, Amendment 44 of license # 05-11997-01. Packaging materials provided by NOAA/GMD.
 - 6. Once the box is sealed, labeled and awaiting pickup from the shipping company the package will be secured in a locked cage to maintain physical security of the ECD.
 - 7. Shipment via appropriate method and in coordination/notification with project POC (Geoff Dutton), ESRL radiation safety officer (Brian Vassel), and Boulder haz-mat specialist (Robert Zook).

In no circumstance will an ECD ever be shipped from Boulder without following this established written SOP.